2021

Transportation Sustainability

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CEE 597S & 697G: Transportation Sustainability

Course Syllabus

Lesson: Wednesday 9:05am – 11:35am
Zoom Meeting ID: 918 8038 7833
Passcode: 757175

Instructor: Eleni Christofa (she/her)
Email: echristofa@umass.edu
Phone: (413) 577-3016
Office: 216 Marston Hall

Office Hours: Tuesday & Wednesday: 12:30 pm-2:00 pm
Office Hour Zoom: 92651558946
Passcode: 482863

Schedule a 15-min time slot via Calendly
https://calendly.com/echristofa/15min?month=2021-02

OR by appointment via e-mail

Catalog Description

An overview of sustainable transportation planning practices and management strategies and policies; current transportation trends; environmental and energy policies; non-motorized modes (mainly bicycles and pedestrians); public transportation; life-cycle assessment for transportation infrastructure; alternative fuel vehicles; vehicle emission estimation models; demand management strategies (including parking policies, pricing strategies).

Class Overview & Attendance Expectations

This remote class has optional synchronous meetings. Some in-class activities will take place synchronously, but students will also have the option to complete them offline. All synchronous content will also be recorded and available through the Moodle course website. Participation in discussions can be done either synchronously during class or asynchronously by engaging with the Moodle forum. Each student is responsible for the material covered and for all assignments made in class whether or not they attend the class and should communicate with the instructor to make alternative arrangements if they are not able to join on days that in-class activities are scheduled for.

Required or Elective: Elective

Prerequisite: 310 or equivalent

Credit Hours: 3

Textbooks and Other Resource Materials

The assigned readings will be available for download on Moodle. In addition, I will often assign readings from the following three books that are available through the UMass Libraries e-reserves (the links can be found on Moodle):

1. Black, W.R. (2010). *Sustainable Transportation: Problems and Solutions*. The Guilford Press, New York, NY.
   `https://tinyurl.com/y3ewoysu`
2. Tumlin, J. (2012). *Sustainable Transportation Planning : Tools for Creating Vibrant, Healthy, and Resilient Communities*. Wiley Series in Sustainable Design. `https://tinyurl.com/y6rusf9h`
3. Shiller, P.L., E. Bruun, and J.R. Kenworthy. (2010). *An Introduction to Sustainable Transportation*. Earthscan, London, Washington DC.
   `https://tinyurl.com/y5evjnnh`

Communication

You can communicate with me via email (echristofa@umass.edu) but please allow up to 48 hours for a response. You can also talk to me during office hours on Tuesdays and Wednesdays 12:30-2:00 pm. Please choose a specific 15-min time slot using Calendly (`https://calendly.com/echristofa/15min?month=2021-02`). If none of the times work for you, please email me and we will find another day and time. I can assure you that there will be plenty of hours that I will be available for appointments.

Course Learning Objectives

1	I know the three aspects of sustainability, and I can discuss how transportation planning practices, policies, and management strategies affect these aspects.
2	I have knowledge about current environmental and energy policies.
3	I have knowledge about contemporary transportation issues in the U.S. and worldwide.
4	I can use vehicle emission models to estimate vehicle emissions.
5	I know how to perform a life-cycle assessment analysis.
6	I can discuss the advantages and disadvantages of different pricing and management strategies.
7	I have knowledge of design practices that improve bike and pedestrian conditions.
8	I can perform a health assessment of transportation projects using the Integrated Health and Transport Impact Modeling tool.
9	I can score projects using various project scoring frameworks.
10	I have improved my ability to communicate in writing and orally.

Course Outline (tentative)

Week	Date	Topic
1	2/3	Introduction; Sustainable & Non-sustainable Transportation
2	2/10	Energy and Environmental Policies *(in-class activity)* Guest Lecture: *Literature Searching, Search Alerts, Citation Management* *Anne Graham*, Science & Engineering Librarian, UMass Amherst
3	2/17	Alternative Fuels, Vehicle Technologies Guest Lecture: Electric Vehicles/Fleets on Campus *Bill Watts*, Transportation Specialist, UMass Amherst
4	2/24	*Wellbeing Wednesday (no classes)*
5	3/1	Transportation and Health – Equity Implications Guest Lecture: Implementation of ITHIM in Nashville, TN *Leslie Meehan*, Director, Office or Primary Intervention, TN Department of Health *(Note it's a Monday)*
5	3/3	Sustainable Decision Making Guest Lecture: MassDOT Project Scoring *Michael Bolduc*, Project Delivery Specialist, MassDOT Highway Design
6	3/10	Emissions Modeling; MOVES; Life-Cycle Assessment (LCA) *Content will be delivered asynchronously*
7	3/17	Zero Emission Bus Technologies *(in-class activity)* Guest Lecture: Electric Bus Implementation in Indianapolis *Annette Darrow*, Director of Service Planning, IndyGo
8	3/24	Personal Rapid Transit, Public Transportation
9	3/31	Aviation & Freight Guest Lecture: Sustainability in Freight *Eric Gonzales*, Associate Professor, CEE, UMass Amherst
10	4/7	Complete/Shared Streets - Safe Routes to School Guest Lecture: Shared Streets and Safe Routes to School *Cassandra Gascon-Bligh*, Community Grants Program Administrator, MassDOT
11	4/14	*Wellbeing Wednesday (no classes)*
12	4/20	Design for Non-motorized Users *(in-class activity)* *(Note it's a Tuesday)*
13	4/21	New Mobility Options; Micromobility; Demand Management Strategies Guest Lecture: Vision Zero *Megan Wier*, Safe Streets Division Manager, City of Oakland DOT
14	4/28	*Student Presentations*

Assignments Due Date Policy

All class assignments are due on the day and time assigned. No late submissions will be accepted unless it has been coordinated with the instructor in advance of the due date.

Assessment Methods (grading and instructor feedback)

- *Weekly Reading Quiz = 15%*
  Every week students will be assigned readings equivalent to 2-3 journal papers (or parts of report) and will be called to answer a few questions based on the readings

they performed via a Moodle quiz. The two lowest grades from the weekly quizzes will be dropped. Quizzes will be due by next week's class.

- *In-class Activities = 15%*
  Three in-class activities will be assigned throughout the semester. These involve students doing research on a specific topic and preparing a presentation of their findings for their classmates.

- *Weekly Article Presentation = 10%*
  Each student will post an article (from newspapers, the Internet, journals, etc.) related to transportation sustainability on the course Moodle forum. The post will include a summary of the article, a critical analysis (including identifying connections with things discussed in class), as well as proposed questions to motivate discussion. Each student will also present this article in class and lead the discussion. The CEE 697G students will present three times during the semester while the CEE 597S twice.

- *Assignments = 30%*
  There will be an assignment approximately every three weeks. The assignments could vary from short essays and paper critiques, to for example performing analysis with a vehicle emissions model or estimating the life-cycle costs of a certain product using the Input-Output Life Cycle Assessment model. Additional problems per assignment will be assigned to the CEE 697G students. Extra credit to be counted towards your assignment grade can be obtained by posting relevant material on Twitter or Instagram or participating in the forum discussion (up to 5 posts).

- *Project = 30%*
  This will be a team project (2 students per team) which will include identifying a transportation related problem on campus, performing a literature review and search of case study on how other campuses/towns have dealt with this issue, and proposing solutions to improve the sustainability of campus. The exact topic should be decided after discussion with the instructor.

Health and Wellbeing

During this time, you may be experiencing new stresses related to the COVID-19 pandemic in addition to other pressures such as health, money, family, and academic concerns or stress and trauma from societal inequities and violence. You are not alone at UMass – many people care about your wellbeing and many resources are available to help you thrive and succeed. The College recognizes that coursework is challenging and that classes are not the only demand in your life. Success in this course and the College of Engineering depends heavily on your personal health and wellbeing. Recognize that stress is an expected part of the college experience, and it often can be compounded by unexpected setbacks or life changes outside the classroom such as those related to COVID-19. I strongly encourage you to reframe challenges as an unavoidable pathway to success. Reflect on your role in taking care of yourself throughout the term, before the demands of exams and projects reach their peak. Please feel free to reach out to me about any difficulty you may be having that may impact your performance as soon as it occurs and before it becomes too overwhelming. I encourage you to contact support services on campus that stand ready to assist you. You can learn about the confidential mental health services available

on campus by calling the Center for Counseling and Psychological Health (CCPH) by visiting their website at umass.edu/counseling. Within the College, you may reach out to your academic advisor, the Office of Student Affairs (http://engineering.umass.edu/current-students/academics-advising) or the Office of Community Equity and Inclusion (rees@umass.edu). There are many other resources on campus for students facing personal, financial or life challenges to find support, stay in school, and graduate (https://www.umass.edu/studentlife/single-stop). Please reach out to me for support finding the resources you need. **The campus is planning several events on two Wellness Wednesdays this semester, February 24th and April 14th. No classes will be held or assignments due on these days.**

Inclusivity Statement

The diversity of the participants in this course is a valuable source of ideas, problem solving strategies, and engineering creativity. If you feel that your contribution is not being valued for any reason, please speak with me privately. If you wish to communicate anonymously, you may do so in writing, speak with Assistant Dean Paula Rees (rees@umass.edu, 413.545.6324, Community Equity and Inclusion (CEI) Hub Marcus 128b), or submit your concern through the College or Engineering Climate Concerns and Suggestions on-line form (tinyurl.com/UMassEngineerClimate) and/or the Positive and Negative Classroom Experience online form (https://tinyurl.com/UMassEngineerClassroom). We are all members of an academic community with a shared responsibility to cultivate a climate where all individuals are valued and where both they and their ideas are treated with respect.

Gender Respect and Title IX

The University of Massachusetts Amherst aspires to be a university environment that is free of discrimination, sexual harassment, and sexual violence. Faculty have the responsibility to inform students of resources and reporting options. If you or someone you know has experienced sexual assault, sexual misconduct, or sexual discrimination please see https://www.umass.edu/titleix/what-to-do for information about resources and reporting options. A report to the Title IX Coordinator may be made at any time (including during non-business hours) by using the Title IX Coordinator's email (TitleIX-Coordinator@umass.edu), telephone number (413.545.6124) or mail. UMass Amherst is committed to supporting community members who report concerns of prohibited conduct. Please reach out to me if you would like assistance connecting with any of these resources/options.

Pronouns and Names

Everyone has the right to be addressed by the name and pronouns that they use for themselves. Students can indicate their preferred/chosen first name and pronouns on SPIRE, which appear on class rosters. Please let me know what name and pronouns I should use for you if they are not on the roster. A student's chosen name and pronouns are to be respected at all times in the classroom. To learn more, read the Intro Handout on Pronouns: https://www.umass.edu/stonewall/sites/default/files/pronouns_intro.pdf

"Dis-Ability" Accommodation and Inclusive Learning Statement

Your success in this class is important to me. We all learn differently and bring different strengths and needs to the class. The University of Massachusetts Amherst is committed to making reasonable, effective and appropriate accommodations to meet the needs of students with disabilities and help create a barrier-free campus. If you have a qualifying disability and require accommodations while participating in this course, please work with Disability Services to have an accommodation letter sent to me in a timely manner. If you have a disability but are not yet affiliated with Disability Services, please register with Disability Services (`https://www.umass.edu/disability/students`). Information on services and materials for registering are also available on their website `www.umass.edu/disability`. *It is incumbent upon you contact me during the first few weeks of the semester, or shortly following registration with Disability Services, to ensure that your accommodations are being sufficiently met, including extra time and note-taking access, as applicable.* Finally, beyond disability accommodations, if there are aspects of the course that prevent you from learning or make you feel excluded, please let me know as soon as possible. Together we will develop strategies to meet both your needs and the requirements of the course.

Academic Honesty Policy

There is no place for a dishonest engineer! Students are expected to do independent work on all assignments. Though discussion on homework and project assignments is allowed, the write-up of solutions/submissions must be your own work and not copied from a colleague or an online source.

The student will be required to use published and unpublished literature in preparing course assignments. Literature includes books, reports, papers, articles, speeches/oral presentations, interviews, and websites. Plagiarism in any form will not be tolerated and will result in a grade of zero. Plagiarism includes, but is not limited to, the following:

- Using thoughts or words of others and representing them as your own, including copying text from other sources without attribution. Direct quotation of other source material may be used if it is highlighted by quotation marks and/or italic font, and the source is acknowledged. Plagiarism also includes the description of concepts or ideas which you have taken from other sources, not copied word for word, but for which you do not attribute the source.
- Copying of papers prepared by other students, regardless of the source.
- Submitting a paper, and representing it as your own work, which was prepared by another.
- Downloading text from a website which you do not attribute the source.

University Academic Honesty Policy and Guidelines will be followed (`http://www.umass.edu/dean_students/academic_policy`).

Prepared by: Eleni Christofa **Date:** 01/27/2021